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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,549	07/27/2001	Harald Richter	W&B-INF-701	4007

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EXAMINER

OLSEN, ALLAN W

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 07/02/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/917,549

Applicant(s)

RICHTER ET AL.

Examiner

Allan W. Olsen

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## DETAILED ACTION

### *Specification*

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 1 and 6 are rejected under 35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "...an etching gas composition containing hydrogen and nitrogen as majority components". In a composition that consists of 49% oxygen, 40% hydrogen and 11% nitrogen, is nitrogen a majority component or a minor component? Does the limitation of claim 1 require the combined amounts of hydrogen and nitrogen to constitute at least 50 % of the composition? Or, does it mean that no other component can be present in an amount greater than the amount of either hydrogen or nitrogen? In the remarks that accompanied the amendment of December 26, 2002 applicant states "[t]he language of claim s has been amended to make it clear that the hydrogen and nitrogen constitute more than 50% of the etching gas composition". It is this statement in the remarks, and not the amended claim, that is clear. The examiner suggests amending the claim to clearly state that the combined amount of "hydrogen and nitrogen constitute more than 50% of the etching gas composition ".

Claim 6 is directed to the inclusion of additives to the etchant. Claim 6 recites "[t]he process according to claim 1 wherein the etching gas composition contains additives for improving etching gas properties in the dry etching process". To clarify what applicant intended by the phrase "improving etching properties" applicants, in the supplemental response filed April 17, 2003 "submit that the additives used for improving etching properties such as NH<sub>3</sub> enable better etching results". However, the criteria of what constitutes a "better" etching result has not established. A result that is considered to be a "better result, for example achieving a high etch rate, could in a different situation actually be an undesired result. What is a "better" result?

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***Declaration***

The Declaration filed on December 26, 2002, under 37 CFR 1.131, is sufficient to overcome the Chen reference (US 6,211,061).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,080,529 issued to Ye et al. (hereinafter, Ye) in view of U.S. Patent 5,986,344 issued to Subramanion et al. (hereinafter, Subramanion)**

Ye teaches a method of anisotropically etching interfacial organic polymer layers. Ye teaches that the preferred etchant comprises hydrogen and nitrogen. Ye teaches etching with a plasma that consists of hydrogen and nitrogen, however Ye also teaches that additives may be included to improve the etching profile or to control residue. Ye teaches that etching low k dielectric materials such as SiLK, FLARE, BCB and the like.

Ye does not teach that the polymeric organic interfacial layer is an ARC.

Subramanion teaches using the low-k dielectric polymer FLARE as an ARC layer.

It would have been obvious to one skilled in the art to use the etching method of Ye to etch an organic-ARC of FLARE because Ye teaches that the method is well suited to etch FLARE.

Ye does not teach using a MERIE, ECR, ICP or helicon plasma apparatus.

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It would be obvious to one skilled in the art to use a MERIE, ECR, ICP or helicon plasma apparatus because each of these apparatus are known for providing a higher density plasma which provides for faster etching rates and high etching selectivity, as well as the ability to use a lower plasma source power which in turn reduces plasma damage to the workpiece.

In regards to the limitations that pertain to process conditions such as flow rates, chamber pressure and magnetic field strength, it is noted that process parameters such as these are considered to be cause effective variables, which may be optimized through routine experimentation. As such, claims to specific values of such parameters cannot provide the basis for patentability.

"Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

In re Aller 105 USPQ 233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmischer 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CCPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

### **Conclusion**

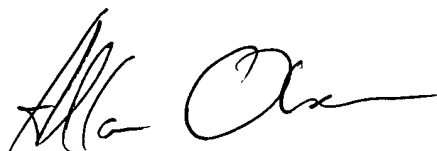
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 703-306-9075. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills, can be reached on 703-308-1633.

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The general fax numbers for TC1700 are 703-872-9310 (non-after finals) and 703-872-9311(after-final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.  
June 27, 2003

A handwritten signature in black ink, appearing to read "Allan Olsen", with a stylized flourish at the end.